REMARKS

Applicant appreciates the Examiner's finding that Applicant's prior remarks are persuasive and the associated withdrawal of the prior claim rejections and the continuing non-final review of the application. Applicant has carefully considered the references that are newly cited in the Office Action and has amended Claims 3, 7-10, 15, 21, and 22 to further clarify the conditions that trigger various cellular signal processing operations to be used to prepare information for communication through a Bluetooth module to a remote Bluetooth device. Applicant submits that the pending claims are patentable for at least the reasons explained below.

1. Status of Claims

Claims 9, 10, 21, and 22 stand rejected under 35 U.S.C. § 103(a) as unpatentable over PCT Published Application No. WO 00/74350 to Rasmusson et al. (Rasmusson) in view of U.S. Pat. No. 6,166,667 to Park (Park).

Claims 3, 7, 8, 15, 16, 19, 20, and 29 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Rasmusson and Park and in view of U.S. Pat. No. 6,879,600 to Jones et al. (Jones).

Claims 12, 13, and 14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Rasmusson, Park, and Jones in view of U.S. Publ. Pat. No. 2002/0065045 to Kim (Kim).

Claims 3, 7-10, 15, 21, and 22 has been amended and Claim 29 has been canceled to be consistent with the previous cancellation of Claim 1 from which it depends. Support for the amended claims is provided by the present specification, and the amendments have been made without prejudice to the filing of a continuation or divisional application.

2. Amended Independent Claims 9, 10, 21, and 22 are patentable over Rasmusson in view of Park:

A) Amended Independent Claim 9

Amended Claim 9 recites, *inter alia*, "a processor that is configured to convolutionally encode the second information for transmission by the cellular transceiver according to a signal processing operation, to *convolutionally encode* the first information according to the signal processing operation for communication by the Bluetooth module *in response to the remote*

Bluetooth device supporting an enhanced communication mode that allows it to receive convolutionally encoded information, and to communicate the first information through the Bluetooth module *without convolutionally encoding* according to the signal processing operation *in response to the remote Bluetooth device not supporting the enhanced communication mode*."

The Office Action concedes on page 2 that these recitations are not taught by Rasmusson. However, the Office Action contends on pages 2 and 3 that "Park teaches a processor that is configured to convolutionally encode the second information for transmission by the cellular transceiver according to a signal processing operation, and to selectively convolutionally encode the first information (see col. 8, lines 35-39) according to the signal processing operation for communication by the module based on whether the remote device supports an enhanced communication mode (see col. 8, lines 15-20 noting that the communication mode is the turbo decoding mode)." The cited sections of Park are shown below with emphasis added for convenience of reference:

> Accordingly, the *adaptive channel decoding device of FIG. 4 can accurately decode input data symbols which are selectively convolutionally encoded* or turbo-encoded in a transmitting side according to service type and transmission frame size. (Park, col. 8, lines 35-39, emphasis added.)

> *In the turbo decoding mode,* the switch 92 is connected to the second demultiplexer 96, and *the selective convolutional/turbo decoder 100 is set to the turbo decoding mode*. Upon receipt of a modulated data frame, the data frame is demodulated, deinterleaved, and symbol-combined by a demodulator 86, a channel deinterleaver 88 . . . . (Park, col. 8, lines 15-20, emphasis added.)

Park's Device Always Uses Convolutional Coding:

Although the cited sections of Park refer to a "selective convolutional/turbo decoder 100," it is improper to interpret Park as teaching that sometimes data is convolutionally encoded and sometimes it is not. As is well known in the art, turbo encoders use recursive convolutional codes, which Park confirms by its teaching that the "component codes for the turbo encoder are recursive systematic ***convolutional*** (RSC) codes" (repetitively applying convolutional coding to different groupings of bits). (Park, col. 1, lines 58-60). Thus, the "convolutional encoder 18" and the "turbo encoder 20" in Park's Fig. 1 both use convolutional encoding, and both modes of the

"selective convolutional/turbo decoder 100" in Park's Fig. 4 use convolutional decoding operations. Convolutional coding is therefore always performed, with the coding length being varied based on whether it is plain convolutional encoding or enhanced recursive systematic convolutional (RSC) encodings.

Park's Device Selects Plain Convolutional or Recursive Systematic Convolutional Coding Responsive to the Data Rate and Frame Length to be Sent, Not Responsive to Receiver Support for an Enhanced Bluetooth Communication Mode:

Park discloses that "[a] significant characteristic of the present invention is the selection of a channel encoding method in response to the data type to be transmitted. That is[,] the method determines whether to use a convolutional or turbo encoder responsive to the data type."(Park, col. 3, lines 16-20.) Further, "the channel encoding device . . . automatically select[s] the convolutional encoder 18 for a low data rate (i.e., voice frame) or a short frame alternatively and selects the turbo encoder 20 for a high data rate or a long data frame." (Park, col. 8, lines 28-33.) Thus, the channel encoding/decoding device of Park uses plain convolutional encoding when a low data rate or a short frame is detected, and uses recursive systematic convolutional encoding when a high data rate or long frame is detected. Nowhere does Park describe or suggest that any circuitry that *selectively convolutionally* encodes data for communication by the Bluetooth module *in response to whether the remote Bluetooth device supports an enhanced communication mode that allows it to receive convolutionally encoded information*.

Consequently, if the teachings of Rasmusson and Park are combined, the combination would not teach or suggest a processor that is configured to convolutionally encode second information for transmission by the cellular transceiver according to a signal processing operation, to *convolutionally encode* the first information according to the signal processing operation for communication by the Bluetooth module *in response to the remote Bluetooth device supporting an enhanced communication mode* that allows it to receive convolutionally encoded information, and to communicate the first information through the Bluetooth module *without convolutionally encoding* according to the signal processing operation *in response to the remote Bluetooth device not supporting the enhanced communication mode*.

For at least these reasons, Applicant submits that the Office Action has not established a *prima facie* case of obviousness of amended Claim 9 because Rasmusson and Park do not teach or suggest all the recitations of amended Claim 9. Consequently, amended Claim 9 is patentable over Rasmusson in view of Park.

B) Independent Claim 10

Amended Claim 10 recites, *inter alia*, "a processor that is configured to interleave the second information over time for transmission by the cellular transceiver according to a signal processing operation, to *interleave the first information over time* according to the signal processing operation for communication by the Bluetooth module *in response to the remote Bluetooth device supporting an enhanced communication mode that allows it to receive interleaved information*, and to communicate the first information through the Bluetooth module *without interleaving the first information over time* according to the signal processing operation *in response to the remote Bluetooth device not supporting the enhanced communication mode*."

The Office Action concedes on page 3 that these recitations are not taught by Rasmusson. However, the Office Action contends on pages 3 and 4 that "Park teaches a processor that is configured to interleave the second information fro [sic] transmission by the cellular transceiver according to a signal processing operation, and to selectively interleave the first information (see col. 8, lines 53-60 noting that the interleaving is based on the selective convolutional encoding which makes the interleaving selective) according to the signal processing operation for communication by the module based on whether the remote device supports an enhanced communication mode (see col. 8, lines 15-20 noting that the communication mode is the turbo decoding mode)." The cited sections of Park are shown below with emphasis added for convenience of reference:

> The selective convolutional/turbo decoder is comprised of the first soft-decision Viterbi decoder 102 for soft-decision decoding the convolutional code symbols CONV_out_0 and CONV_out_1, or the turbo code symbols TC_out_0 and TC_out_1 and fed-back turbo code additional information Z_k, *an interleaver 112 for interleaving the output* of the first soft-decision Viterbi decoder 102, a second soft-decision Viterbi decoder 114 for soft-decision

decoding the *interleaver output* and the turbo codeword symbol TC_out_2 . . . . (Park, col. 8, lines 53-60, emphasis added.)

In the turbo decoding mode, the switch 92 is connected to the second demultiplexer 96, and the selective convolutional/turbo decoder 100 is set to the turbo decoding mode. Upon receipt of a modulated data frame, *the data frame is* demodulated, *deinterleaved*, and symbol-combined by a demodulator 86, a channel deinterleaver 88, and a symbol combiner 90 under the control of the CPU 82 . . . . (Park, col. 8, lines 15-21, emphasis added.)

Park's Encoder Device Always Uses Interleaving:

Although the cited sections of Park refer to interleaving, it is improper to interpret Park as teaching that sometimes data is interleaved and sometimes it is not. Park's Fig. 1, shown below, illustrates the data flow pathway through the adaptive channel encoding device that encodes data for transmission to the decoding device of Fig. 4.

Fig. 1 of Park (annotated)

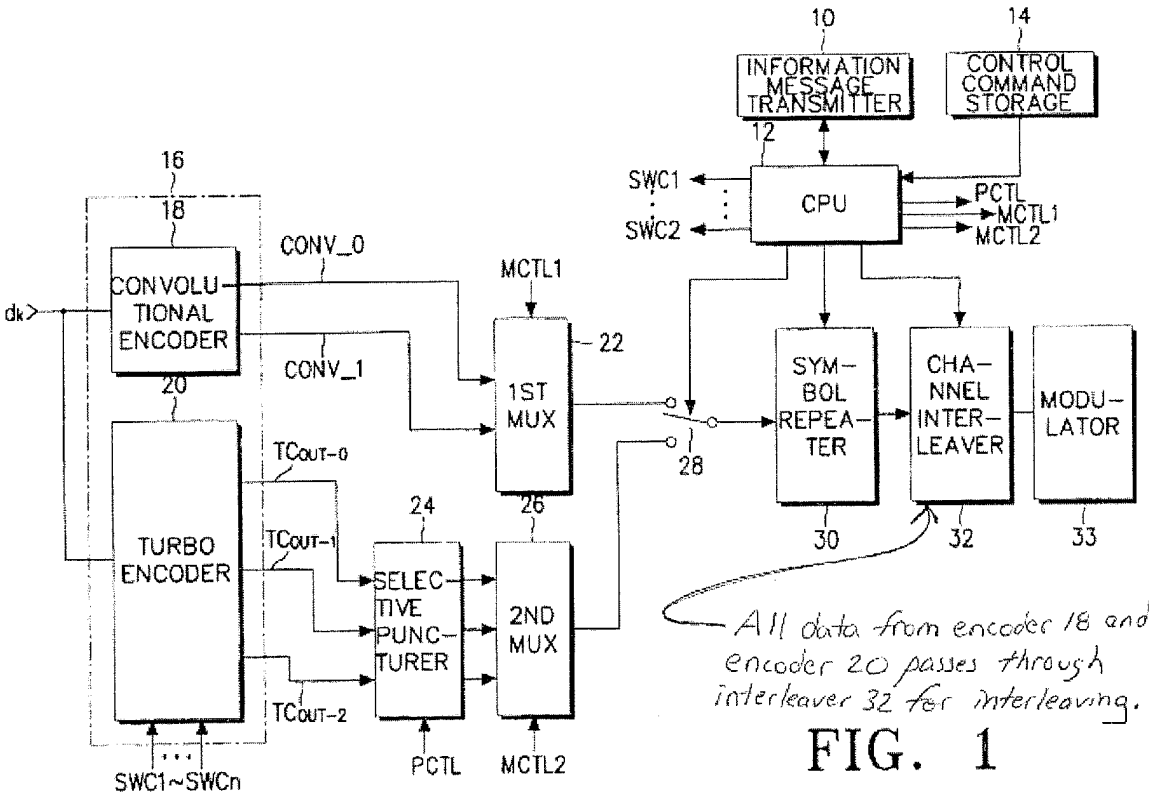

FIG. 1

Referring to Fig. 1 above, all data that is output from both encoder 18 and from encoder 20 passes through the interleaver 32 where it is interleaved. Park therefore *applies interleaving to all data* that is transmitted from the encoding device.

Park therefore correspondingly describes that both the convolution mode and the turbo mode of the receiver of Fig. 4 deinterleave the received data. In particular, Park describes that "*in the convolutional decoding mode*, ... upon receipt of a modulated data frame, *the data frame is* demodulated, *deinterleaved*, and symbol-combined by a demodulator 86, a channel deinterleaver 88, and a symbol combiner 90 under the control of the CPU 82." (Park, col. 7, lines 59-65.)

Thus, the channel encoding/decoding device of Park does not selectively interleave/deinterleave data but, instead, always interleaves/deinterleaves data because both turbo decoding and convolutional decoding modes deinterleave the data frame. Nowhere does Park describe or suggest that any circuitry *selectively interleaves* data for communication by the Bluetooth module *in response to whether the remote Bluetooth device supports an enhanced communication mode that allows it to receive interleaved information*.

Consequently, if the teachings of Rasmusson and Park are combined, the combination would not teach or suggest a processor that is configured to interleave second information over time for transmission by the cellular transceiver according to a signal processing operation, to *interleave the first information over time* according to the signal processing operation for communication by the Bluetooth module *in response to the remote Bluetooth device supporting an enhanced communication mode that allows it to receive interleaved information*, and to communicate the first information through the Bluetooth module *without interleaving the first information over time* according to the signal processing operation *in response to the remote Bluetooth device not supporting the enhanced communication mode*.

For at least these reasons, Applicant submits that the Office Action has not established a *prima facie* case of obviousness of amended Claim 10 because Rasmusson and Park do not teach or suggest all the recitations of amended Claim 10. Consequently, amended Claim 10 is patentable over Rasmusson in view of Park.

C) Independent Claim 21

Amended Claim 21 is a method that corresponds to the wireless terminal of amended Claim 9, and is therefore submitted to be patentable for at least the reasons explained above for amended Claim 9.

D) Independent Claim 22

Amended Claim 22 is a method that corresponds to the wireless terminal of amended Claim 10, and is therefore submitted to be patentable for at least the reasons explained above for amended Claim 10.

3. Dependent Claims 3, 7, 8, 15, 16, 19, and 20 are patentable over Rasmusson and Park in view of Jones:

Claims 3, 7, 8, 15, 16, 19, and 20 are dependent upon amended independent Claims 9 and 21, and are therefore submitted to be patentable for at least the reasons explained above for amended independent Claims 9 and 21.

4. Dependent Claims 12, 13, and 14 are patentable over Rasmusson, Park, and Jones in view of Kim:

Claims 12, 13, and 14 are dependent upon amended independent Claim 9, and are therefore submitted to be patentable for at least the reasons explained above for amended independent Claim 9.

5. Conclusion

In view of the above amendments and remarks, Applicant respectfully requests withdrawal of all objections and rejections and the allowance of all claims in due course. If, in the opinion of

the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is encouraged to contact the undersigned by telephone at (919) 854-1400.

Respectfully submitted,

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Susan E. Freedman
Date of Signature: July 30, 2009